

## Magnetic Excitations in the Haldane System $R_2\text{BaNiO}_5$

Tetsuya YOKOO\* and Jun AKIMITSU

*Department of Physics, Aoyama-Gakuin University, 6-16-1 Chitosedai, Setagaya-ku, 157-8572 Tokyo, Japan*  
*CREST, Japan Science and Technology Corporation (JST)*

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Magnetic excitations in 1-dimensional (1D) antiferromagnet  $R_2\text{BaNiO}_5$  ( $R=\text{Nd}$  and  $\text{Y}_{1-x}\text{Nd}_x$ ) has been investigated by means of both polarized and unpolarized neutron scattering technique. Observed spin gap at 1D zone center above Néel temperature was confirmed to be originated by the same as Haldane gap obtained in the pure Haldane system  $\text{Y}_2\text{BaNiO}_5$ . In the 3D ordered region where the magnetic Bragg peaks clearly develop, the gap energy shows the sharp upturn at around  $T_N$  and increases linearly with decreasing temperature. Polarized neutron experiment reveals the coexistence of both quantum 1D Haldane and 3D long range antiferromagnetic (AF) phases.

**KEYWORDS:** Haldane gap, Heisenberg antiferromagnet,  $R_2\text{BaNiO}_5$ , low-dimensional